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S.H. 1827.
PRACTICAL OBSERVATIONS

ON

THE TEETH AND GUMS,

WITH THE

Best mode for their Preservation.

DEDICATED BY PERMISSION TO

JOHN ALDERSON, ESQ. M.D.

BY

I. L. LEVISON, SURGEON DENTIST,

Late of 54, Berwick-Street, Oxford-Street, London.

“When first the white blossoms of his teeth appear, breaking the
“crimson buds that did incase them, that is a day of joy.”

LONDON :

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**W. ROSS, PRINTER,
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PREFACE.

WHAT innumerable sources of mental improvement would be derived from the study of the Natural History of Man, if given in a popular and pleasing form. Our slumbering faculties, when once awakened, must excite the mind's energy to contemplate the link man holds in the chain of created beings ; and this study ought to begin with some knowledge of the curious mechanism displayed in the structure of the human frame, where every part is so admirably adapted to the uses it has to perform in the general economy. If we examine a part of the complicated mechanism of man, we find it so perfect, that we immediately recognise it to be the work of the beneficent and almighty Creator. The learned and pious Dr. Paley has treated of the structure of the Eye in a very pleasing and instructive form :—by the mechanism of the eye, man has been taught the laws of *Mechanical Optics* ; even the idea of blackening the insides of Telescopes was furnished by observing the *black paint* (pigmentum nigrum) which is spread under and over the pupil, and extends to the exterior edge of the iris, to prevent the rays of light from passing off at right angles. Thus, by this admirable provision, the object is thrown on the retina, and forms a clear and correct miniature picture of the things

presented to it from without. It is, by contemplating the organic structure of man, that we become acquainted with the physical laws by which the various functions are manifested, and our minds are raised with adoration and gratitude to "Nature's God," as the source and cause of all things.

With such feelings, I have, therefore, undertaken the pleasing task of writing the small Work now submitted to the public. Its form is intended for general reading, therefore it is divested as much as possible of the anatomical and physiological phraseology. In the first part, the Natural History of the Mouth is given, which embraces the laws of the mechanical structure of the jaws, their various and complex motions, the first and second dentition, the economy of the gums, the uses of the saliva, &c. &c. &c. The second part of the Work comprehends the causes of Diseases of the Teeth and Gums, with the consequences on the general Health, &c. ; concluding with practical modes of Preserving the Teeth, and retarding the progress of decay, when it has once commenced its corroding action.

I. L. LEVISON.

21, *Mason-Street*,
corner of *Bourne-Street*, *Hull*. }

ADVERTISEMENT.

THE present work, now submitted to undergo a public ordeal, was undertaken not for any pecuniary emolument, nor in the spirit of literary vanity, *but with the hope that it might prove of general utility*. I feel all that timidity for this offspring of my brain (as it is now entering "en solitaire" into a world where it may be much annoyed and vituperated) which the fond parent does, when his son leaves him to take an active part on the theatre of life. I therefore humbly intreat all critics (whether they are professionally so, or not,) to treat this poor thing not too harshly, for I will freely confess *it is only a foster child*, although it has become as one of my own, having taken great care and trouble to render it *better*, from the time I first adopted it.

To those, then, who may recognise in this book the opinions of other writers on the Diseases of the Teeth and Gums, it may be observed, that we are all the children of education; the mind at our birth, is as a blank, but endowed with certain capacities which are roused and excited through the medium of the senses, and all ideas are by them impressed on the memory, either through the organs themselves, or assisted by the instruction of others. *And it is*

thus that we acquire knowledge from the aggregate experience of the past, which in time, by amalgamation and composition, becomes our own legitimate property. To you, then, sagacious critics, I once more appeal, as I reverence your great penetration ; yet, though dragged before your self-constituted tribunal, *I stand with conscious rectitude*. You may convict me and find me guilty of having received much instruction on the anatomy, physiology and pathology of the mouth from many French and German writers, and from our own distinguished countrymen, Mr. John Hunter and Mr. Joseph Fox, from other writers since their time, and from a Treatise on the Teeth, published in London many years past, by Thomas Berdmore, Esq. I candidly confess my inability to *analyse* what portion of each may have been *compounded* of these different *constituents* in the various parts of this Work ; yet it is with pleasure I acknowledge my great obligation to these eminent men, whose Theories have been so impressed on my memory, which most probably I have mechanically adopted : but I make this declaration, *that I have not in one instance committed an intentional plagiarism*, for when I recollected the authority, it gave me much pleasure “ to render unto Cesar that which was Cesar's due.”

I. L. LEVISON.

DEDICATION.

TO JOHN ALDERSON, ESQ. M. D.

PRESIDENT OF THE HULL PHILOSOPHICAL AND LITERARY SOCIETY ;
SENIOR PHYSICIAN TO THE HULL INFIRMARY, AND CONSULTING
PHYSICIAN TO THE LYING-IN CHARITY ; HONORARY
MEMBER OF THE YORKSHIRE PHILOSOPHICAL
SOCIETY ; CORRESPONDING MEMBER
OF THE MEDICO-CHIRURGICAL
SOCIETY, EDINBURGH,
&c. &c. &c.

Most respected Sir,

This Work on the Diseases of the Teeth and Gums, was undertaken with the hope that it might prove the means of preventing many of the unpleasant consequences resulting from the premature loss of them, which may occasion many deformities, and which invariably is a source of much inconvenience and trouble ; as you must often have witnessed during your long and successful practice,—a practice, in which the philanthropist was ever as conspicuous as the physician ; and the extensive engagements you now have, is an indisputable truth that your highly gifted talents in the practice of physic are appreciated.

Although, Sir, the merits of this Work (if it possess any) cannot add to your scientific fame in any department of the medical profession,

yet it enables me to pay that tribute to your worth, which your great kindness to me as a stranger has strongly excited. From my first visiting Hull, I have experienced your valuable patronage; you have also (at my solicitation) allowed your respected name to appear to this book, which will ever be remembered with feelings of gratitude and sincere esteem.

May your useful life be spared in the enjoyment of your health and faculties, many, many years, for the benefit of society, and the edification and pleasure of your numerous friends. Among the latter, it will be my best endeavour and most earnest wish to be considered.

It is with every feeling of esteem, that I now subscribe myself,

Most respected Sir,

Your very obedient servant,

I. L. LEVISON.

*21, Mason-Street,
corner of Bourne-Street, Hull. }*

INTRODUCTION.

IN treating of the Diseases of the Teeth and Gums, a pre-knowledge of their peculiar structure, and the economy of the mouth, will be essential. We shall, therefore, offer some few remarks on the first and second dentition, &c.

The mouth is composed of two jaws, an upper and an underone, called the superior and inferior maxillary bones. Its cavity contains thirty-two teeth (in the perfect adult set), situated in sockets which they fit exactly, and are covered with gums; besides, there is a palate or roof, tongue, glands, &c.

For the sake of perspicuity, and to avoid useless repetition, our description will be confined to one jaw, as they both nearly resemble each other. The jaw-bone has thin bony processes running longitudinally from one extremity to the other, on its anterior and posterior sides; these two processes are subdivided by small transverse partitions, which form the sockets to contain the teeth. These sockets (termed the alveolar processes) are lined with a delicate membrane filled with blood-vessels, nerves, &c.; and besides this protection to the inner cavity of them, on their external surfaces are placed the gums, a kind of semi-cartiliginous substance covered inferiorly and superiorly with vascular membranes, which supplies them with vitality. The gums preserve the sockets from the action of the atmospheric air, which would otherwise cause them to be absorbed; they also protect them from being injured by the percussion of hard substances coming in contact with them; and which would disturb the process of the embryo teeth, whilst forming in these preparatory receptacles, which nature has by this beautiful contrivance rendered so impervious. As the teeth may be considered one of the most interesting parts of the animal economy, a knowledge of the formation of them will furnish to the contemplative mind many rational sources for philosophic pleasure. Each tooth is at first a soft

pulpy substance, covered with a membrane, the whole being the exact shape of the tooth it is destined to represent; and each is attached by a nerve, which entering at the lowest extremity, ramifies over the internal cavity. The arteries at a very early period (even before birth) begin to deposit the earth that gives them strength and consistence; and when the child is born, ossification has proceeded towards the completion of the bony part, whilst the investing membrane secretes the peculiar and beautiful substance, the enamel that covers them. When the crown of a tooth is nearly finished, the pulp elongates, and forms the roots or fangs of it. (a)

In speaking of the diseases attending the teething of children, we must be confined to some general remarks, as the size of the work will not admit of entering into the minutiae of all the various consequences that may take place during this very curious operation of nature; we shall therefore only enumerate some few of the unpleasant symptoms attending the first dentition. It is very frequently the case that the general health is much affected, and sometimes the whole system is so deranged, that death terminates the sufferings of the infant. When the teeth are making their way through the gums, even in favourable cases, the child becomes uneasy and secretes much saliva; sometimes the gums are so tender that it cannot bear the pressure of its own cheeks—that when it receives the nipple, it sucks with much agony, until relieved by the tooth coming through the gums, to effect which the surgeon consulted assists nature by lancing them: *this operation invariably gives much ease to the infant, by its accelerating the passage of the teeth.* It is also very essential to give the child small doses of aperient medicine; If the sleep is disturbed, some soothing cordial that possesses an anodyne property. These attentions, with plenty of fresh air, will prevent the health of the child from being much affected. But there are sometimes many lamentable consequences attending this interesting period; strong convulsions, dangerous fevers, and (on the authority of many able physicians) inflammation of the brain. When the latter is the case, the sufferings of the infant generally terminate with death, or the disease of the brain called hydrocephalus: local bleeding and the use of the warm-bath is recommended, with refrigerating and anti-phlogistic remedies; *but in every case*, says a judicious French writer, where the child is unusually affected, the medical attendant of the family should be consulted.

The temporary set of teeth are, when complete, twenty in number,—ten placed in each jaw, which may be described thus: four situated in the anterior part of the mouth, called the *incisores* or cutting teeth, as their office is to divide the food; next to them are plac'd the two cuspidate or eye teeth, *these* are formed like those of carnivorous animals,

and as they are for tearing flesh, they have also been called canine or dog teeth : immediately behind them are placed (at each side) two molares or grinders, and their *name* explains the part they perform during mastication. The whole, when enumerated, will be found the number before mentioned. As these teeth have only to perform their office for a definite period of time, they are but small and the attachments weak, for they soon decay to make room for a stronger and more permanent set ; the latter, as they increase in size, press against the sockets containing the temporary set ; an absorption of their fangs takes place, they become loosened, and are easily removed. On extracting the milk teeth, the fangs appear irregularly rough as if broken ; this is by no means the case, *for they are sometimes only partially worn down*,—the denuding process having been greatest on that side at which the pressure of the forming teeth was most exerted, and this causes the absorption to be more on one side than on the other. The temporary teeth generally make their appearance in most instances about the sixth or seventh month ; they are completed by the third year, and remain until the sixth or seventh, when the process for their removal takes place as we have before described. The permanent teeth may be much obstructed if the milk ones are not extracted in time ; and as Mr. Fox observes, whenever nature seems tardy in removing them herself, as the beauty of the mouth, and the proper articulation of speech depends upon the regularity of the second set, the teeth acting as the impediment should be removed. *It therefore becomes a duty of parents, and those who may have the care of children, to attend to the change that takes place during the shedding of the deciduous, and the coming of the permanent ones :* for these latter teeth were destined by the beneficent Author of us to last through life (or another set would have been provided) ; therefore they are much larger and stronger than the first ones. It must be obvious, that without assistance they are liable to be forced out of their proper curve, or by pressing and over-lapping each other may bring on a decay ; besides, such irregular ones form cavities for the tartarous mucus to deposit itself. But if the teeth acting as impediments be removed, the new ones will take their proper places, but much depends on the temporary teeth not being extracted too prematurely, for many deformities may result from such a practise. For example, the central incisores of the lower jaw are first loosened, they are then removed ; and if there is not sufficient space for the new teeth that supply the place of those, the two lateral incisores must also be extracted. The incisor teeth of the upper jaw are the next, and the same remarks apply to them, but the cuspidate or eye teeth, although they stand next, are longer in coming through the gums. Supposing an operator, ignorant of this fact, should extract them next, the new cuspidate, from having lost all resistance, either come through the posterior side, or stick so out at the anterior part of the gums, that they resemble tusks ; the teeth that supply the temporary

molares (precede the eye teeth) are called bi-cuspidates, from having two small points. They have ample space, for they are smaller than the first molares; but the cuspidate, which are of the greatest consequence in preserving the beautiful curve and symmetry of the mouth, become an unpleasant deformity. Similar remarks may be applied to all the other teeth, and therefore the dentist ought to be regulated by the appearance of the gums and the forming teeth, and not altogether by the age of the child, or the period usually observed for their evolution, *as there are many exceptions.*

It demonstrates the benevolence of the Creator, that in the structure of the human frame every exigency is provided for, and that peculiarly so in the mouth. The child being born without teeth, is supplied with a nutritious aliment suitable to its infantile powers of digestion. But as it increases in strength, and there is a greater development of its bodily functions, a set of teeth is furnished to prepare nutritious food that requires mastication, but they are only to remain the first six or seven years of childhood, and are then replaced by those termed the *permanent set*.

To our non-medical readers, these concluding remarks on the whole economy of the mouth, may prove interesting and instructive. The upper jaw is connected with the bones of the face, those forming the sockets for the eyes, the ears, &c. And as it is nearly immovable, it has been compared (by Richerand and others) to *an anvil*, during the masticatory process, as the lower jaw strikes as a hammer against it.—The articulation of the lower jaw to produce its various motions, the provision made to protect its joints from wearing by constant friction, and the whole mechanism of the surrounding parts, must excite, even in the commonest observer, the most vivid feelings of adoration to the Almighty Artificer. And it will appear obvious, that the structure of the human frame has furnished data for various mechanical contrivances. The inferior maxillary (lower jaw) has placed at its extremities, bulbs of an oval form (condyles); these are fitted into sockets of a similar shape in the upper jaw, and are attached by strong muscles and ligaments.—The muscles being elastic, answer the purpose of main-springs, which are set in motion by the power we possess called *volition*; the ligaments are stops or small wheels to regulate the motion, and to give a compound action, connecting this bone (the lower jaw) with the other parts of the mouth's apparatus. Each bulbous extremity has an insensible substance placed over it, quite smooth and cartilaginous, to prevent the friction from injuring it, or wearing the socket in which it moves. But as a further protection, there is secreted a mucilaginous fluid (answering the purpose of oil) which keeps the sockets constantly moistened, and thus the injury is prevented that would result from a constant collision of two hard substances, such as the bones, rubbing together. This fluid is called

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synovia, and is secreted from glands situated in the joints ; they are so placed, that in proportion to the force and motion exerted by the condyles in the socket, a greater or less quantity is expressed, and thus all exigencies are provided for. (b)

Besides the teeth and jaws, there are two bones united together to the upper maxillary, called the *ossa palati* ; these form the arch or roof of the mouth, and also the floor of the nose.

From this account of the bony fabric of the mouth, we are led to its economy, as it is the seat of the organs of taste, speech, &c. The tongue, *as the organ of taste*, destined to examine the food (prior to its being divided and prepared by the teeth) "is furnished at its extremity with numerous nervous papillæ," and so exquisitely sensitive they are, that any effluvium or aromatic excites them, producing sensations of pleasant or unpleasant, *and then we have ideas of bitter, sour, sweet, &c.* If any thing is placed on the centre of the tongue, its flavour is not accurately recognised until the end or tip comes in contact with the substance, and tests its quality and property. Besides this valuable office performed by the tongue, by it we express ourselves, and hold converse with our fellow-creatures ;—a power conferred by the Deity on man alone, and which raises him to the first link of created beings ;—this peculiar blessing enables us to communicate on rational and philosophic truths, and all those advantages we derive from civilization. The mouth is also furnished with glands, situated on each side of the face ; "they are called the parotid, the sub-maxillary, and sub-lingual glands, besides others named from their situation." These glands *secrete* the fluid called saliva, and which is composed of water, four parts, and one of albumen ; besides, other adventitious substances, such as earthy and alkaline salts, are sometimes held in solution with it. The saliva answers many useful purposes in the animal economy ; by its moistening the mouth, the teeth are preserved from being much injured by the friction used in mastication, and as this *fluid* mixes with the aliment (with which it is nearly saturated) it may impart to the food some peculiar property, by which it is rendered capable of being acted upon chemically by the gastric juices, when it is conveyed into the human laboratory. (c)

The gums, covered with membranes so highly vascular, have been placed by our benevolent Creator to act as the *thermometer* of the mouth ; which teaches us the degree of heat or cold at which fluids and solids may be taken with safety into the stomach.

The soft palate, and a fleshy substance of a conical shape (called the *uvula*) suspended at the posterior extremity of the roof, perform a very useful purpose during the act of deglutition, by closing the passage

between the mouth and nose, and thus preventing the liquid and particles of food from going up it. The roots of the tongue being placed so exactly below the soft palate and uvula, act as an auxiliary guard to the nose ; and from their manner of articulation, effectually prevent any thing from going down the respiratory passage (larynx). When in the act of swallowing liquids, the tongue becomes a gutter, rather inclined, and by this contrivance a spout is formed at the back part of it to convey it down the funnel-shaped cavity (pharynx) leading to the stomach. When solid food has undergone the masticatory process, the tongue collects all the particles together and places them on its centre, which acts as an inclined plane ; but as it slides towards the cavity, the side placed nearest the larynx becomes so considerably raised in its inclination, that not a particle escapes down the respiratory passage, but the mass is propelled down the funnel-shaped one. Thus, when we contemplate our complicated mechanism, *we can but exclaim with feelings of gratitude to the Author of our being*, "that we are fearfully and wonderfully made."

PRACTICAL OBSERVATIONS,

&c.

REMARKS ON THE CONSEQUENCES OF THE DECAY OF THE TEETH.

WHEN we reflect on the great utility of the teeth, either for the purposes of masticating the food, or in assisting the tongue to give force of expression in all verbal communications, their loss must be considered as a source of much inconvenience and trouble. In all cases where a premature decay of them occurs, the loss occasions a great deformity to the mouth, invariably gives an unpleasant fœtor to the breath, and the carious remains of them may probably injure the surrounding parts. Besides, the inability of properly masticating the food, may bring on a miserable catalogue of diseases consequent on the derangement of the stomach, from receiving the aliment unprepared by those instruments which nature furnished the mouth with for this essential purpose.

These very urgent reasons have induced many eminent physiologists to pay some particular attention to the patho-

logy of the mouth ; and their laudable endeavours to prevent some of the unpleasant consequences of *caries*, have in a great measure been successful. But when from an original organic disease of the teeth, their decay is inevitable (at least no certain cure can be effected), ingenuity has exhausted every mechanical contrivance, either to repair them when only parts are removed, or supply, by artificial means, others to take their places when quite destroyed ; thus preserving the symmetry of the mouth by an elegant and useful invention.

The causes for the decay of the teeth must be, like many other laws of the animal economy, subjected to much speculation. Many writers on dental surgery have considered the proximate cause for *caries* as referable to an original organic disease of the membranous pulp, from which the teeth are formed ; but others have supposed that decay is always a sympathetic affection arising from dyspepsia. Some writers have supposed that caries is caused from taking liquids and solids at extreme temperatures. By others, this disease has been attributed to the action of acids, and by every thing that has a tendency to remove the calcareous earth of the teeth. Experience proves that each of the before mentioned may produce a decay of them. Every thing that can disturb the crystalline structure of the particles of which the teeth are composed (“ and which are partly held together by the attraction of cohesion”), must on every removal of the earthy molecule weaken this force of attraction, which renders them brittle, and they break away or become diseased by caries. If the calcareous earthy particles are not always removed when a morbid action affects the health of a tooth, still as the disease proceeds a chemical change is effected, and the lime seems to lose its indurating property.

The caries of bone has been compared to ulceration in soft parts, and the analogy is founded on the symptoms and progress of them both. The ulceration of flesh, and caries in bones, commence with inflammation and a morbid action of the parts. Whilst matter is forming in the one, and decay is proceeding in the other, a throbbing sensation is felt, and the pain increases as the whole part becomes affected. If proper remedies are applied, a cure may be made; but generally (in teeth), when caries has attacked the whole crown, a death of the fang also follows as a consequence, which is the case when no sensation of pain is felt, and the tooth becomes black, undergoing rapid decomposition, and is attended with an unpleasant taint to the mouth.

Those who have suffered the acute pain of tooth-ache, and have lost them by neglecting to apply to the surgeon dentist for his professional assistance, ought not to complain so much as those dyspeptic persons, who frequently lose the greater part of their teeth without any such painful intimation. It will, therefore, be the object of the following pages to describe the various diseases to which the teeth and gums are liable, and the treatment adopted for the cure of them; also the various modes with which the surgeon dentist supplies the loss of teeth, gums, palate, &c.

ORIGINAL DISEASE IN THE ORGANIC STRUCTURE OF THE TEETH.

When the caries of the teeth arises from an original disease of them, they decay in pairs; and as that frequently occurs in those that are obtruded from the gums at the same

time, the late Mr. Joseph Fox considered that the pulps from which they were formed were in a diseased state, or they received the seeds of decay from some general unhealthy state of the child during the process of their formation ; and, therefore, the same causes that would super-induce the caries of one, will have the same effect on the other. In these cases, the teeth decay rapidly, attended with much pain, and very often as soon as they make their appearance in the mouth : when that is the case, their removal becomes imperative (*i. e.* if they cannot be stopped) before they communicate the disease to the neighbouring teeth and sockets.

By observing the strictest rules of cleanliness, such as washing the mouth after every meal with a little tincture of myrrh and water, or any other spirituons astringent, and the use of a moderately hard brush, the baneful effect of foetid matter may be prevented from injuring the other teeth.—Children should be urged to observe these rules, as the teeth are of the greatest consequence for the purpose of masticating the food, for the whole system suffers from conveying the aliment into the stomach before it is properly divided and rubbed to pieces. Their preservation ought to be a paramount consideration ; for, besides the deformity occasioned by the loss of them, many local diseases are likely to follow.

When the teeth become so carious that a cavity is formed into the bony part, three causes materially further the decomposition of the whole, *viz.* the action of hot and cold liquids, the atmospheric air, and the lodging of particles of food in the hollow part. Firstly, the action of liquids on the bone that is softened by disease, must have a tendency to remove the earthy particles of which the tooth is partly

composed. Besides, fluids coming in contact with the highly vascular inflamed membrane that lines the cavity of it, always produces the most exquisite pain. Secondly, atmospheric air may generate a peculiar acid, by its oxygen mixing with the moisture in the cavity, which increases the morbid action. At all events, the air finding an ingress into the tooth diseased, must assist in its decomposition; at the same time, if its temperature is at the freezing point, it brings on a greater inflammation of the parts, and probably affects the gums and the neighbouring teeth with very acute and painful sensations. And, lastly, the particles of food that are conveyed into the tooth when acted on by both the last causes, there arises a putrefactive fermentation; much foetid matter is produced; the breath becomes tainted; the caries proceed to remove the whole bony part of the tooth; the enamel breaks away, and the person is deprived of a useful and ornamental part of the mouth; suffers much pain, and very probably the next teeth may have become affected.

These remarks apply particularly to the molares, and it is these teeth that are most affected with an organic predisposition to decay. Therefore, to obviate the entire removal of a diseased tooth, when it is discovered that a cavity is formed, application should be made to a dentist: he would remove all the diseased bone and clean out the part; then with proper instruments, made for this operation, the hollow cavity of the tooth would be filled with gold leaf, &c. and afterwards burnished quite smooth, so that it would be perfectly pleasant to the tongue. Thus a diseased tooth may be rendered equally useful for all purposes, as any of the others that are quite sound.

Teeth that decay from constitutional disease affecting them, have a dull opaque chalky colour, sometimes tinged with a yellowish, or greenish yellow hue. The bone is first attacked, and, when partly destroyed, the enamel breaks, and a cavity is discovered.

DECAY OF THE TEETH FROM DYSPEPTIC CAUSES.

When the teeth are affected, so as to become carious from the deranged state of the digestive organs, many are attacked with the disease at the same time; and what distinguishes this disorder from those depending on other causes, is, that frequently nearly the whole crowns of the teeth are removed without the individual suffering any particular pain, only occasionally when acids or sweets are taken, then the curious sensation is felt of having the teeth set on edge. This latter effect arises from the constant abrasion of the earthy particles; and the nervous membrane, from not being sufficiently protected by its calcareous walls, becomes very sensitive. It is at this period of the decay that a constant uneasiness is felt, for every thing taken into the mouth may excite an unhealthy action in the membrane lining the cavity of the teeth, so that the food does not undergo the process of grinding that it may mix with the saliva, but is conveyed nearly solid into the stomach; and, as this only tends to aggravate the dyspeptic consequences, a re-action takes place, and the teeth decay with such rapidity, that it is lamentable to contemplate so much destruction.

Whenever the stomach is affected with indigestion, flatulence, &c. particular attention ought to be paid to the mouth to keep it very clean, and wash it with astringents and antiseptics; but, as these will only retard some of the consequences, it is very essential that the medical attendant of the family should be consulted, as he would have recourse to the proper means to restore the general health.

The teeth soonest affected with *caries* are the upper incisors, and as these are situated in the front of the mouth, their loss must always be regretted. It is peculiarly unpleasant when this occurs to persons who speak in public; however energetic their language may be, it ceases to produce a corresponding effect, as the enunciation is defective and the expression confused; for in those words in which many dentals occur, instead of receiving the assistance and force from the front teeth, the tongue is thrust between the lips, occasioning the individual much confusion and chagrin. It is, then, with peculiar satisfaction, that we inform those who may labour under such disadvantages, that those who practice dental mechanism can supply, by artificial means, one or more of these teeth. After the crowns of the teeth (the part that is visible) are removed by caries, the decay sometimes ceases, and the fangs remain quite sound and healthy in the sockets; it is then that an application made to the surgeon dentist may be attended with permanent benefit. We have a plan of engrafting new crowns to the fangs that remain, corresponding with those that have been destroyed by disease; and these *new crowns* fit so closely to the gums, that the nicest observation could not detect their being fitted by art. This very elegant mode of supplying the front teeth, has an advantage over every other; for the beauty of the mouth is

Whenever the stomach is affected with indigestion, flatulence, &c. particular attention ought to be paid to the mouth to keep it very clean, and wash it with astringents and antiseptics; but, as these will only retard some of the consequences, it is very essential that the medical attendant of the family should be consulted, as he would have recourse to the proper means to restore the general health.

The teeth soonest affected with *caries* are the upper incisors, and as these are situated in the front of the mouth, their loss must always be regretted. It is peculiarly unpleasant when this occurs to persons who speak in public; however energetic their language may be, it ceases to produce a corresponding effect, as the enunciation is defective and the expression confused; for in those words in which many dentals occur, instead of receiving the assistance and force from the front teeth, the tongue is thrust between the lips, occasioning the individual much confusion and chagrin. It is, then, with peculiar satisfaction, that we inform those who may labour under such disadvantages, that those who practice dental mechanism can supply, by artificial means, one or more of these teeth. After the crowns of the teeth (the part that is visible) are removed by caries, the decay sometimes ceases, and the fangs remain quite sound and healthy in the sockets; it is then that an application made to the surgeon dentist may be attended with permanent benefit. We have a plan of engrafting new crowns to the fangs that remain, corresponding with those that have been destroyed by disease; and these *new crowns* fit so closely to the gums, that the nicest observation could not detect their being fitted by art. This very elegant mode of supplying the front teeth, has an advantage over every other; for the beauty of the mouth is

preserved, and the enunciation is as clear as if the original teeth had remained. This operation is unattended with pain or any inconvenience, if it is performed by a dentist who combines with the *mechanical*, a knowledge of the surgical branch of his profession; for the only precaution that is necessary, is, to destroy the vitality of the membrane lining the cavity of the fang, which may be done with the actual or potential cautery; and, when all sensation is destroyed, the part is perforated with a small instrument, and the tooth is fixed in the manner before described. If the membrane retains its vascularity, every thing that tends to derange the nervous system will affect that also. And it may be locally affected by the pivot, which is inserted in the cavity, acting as an extraneous body (*i. e.* if the membrane still retains its vascularity), and exciting much inflammation and very acute pain, until the irritating cause is removed.

THE EFFECT OF EXTREMES OF HEAT AND COLD, AS A CAUSE FOR DECAY OF THE TEETH.

Every person must have experienced very unpleasant sensations when taking very hot liquids of any kind; or from drinking cold water, and eating ice-creams when they have been very warm; in short, from taking liquids or solids at either extreme temperature. The effect of these extremes, is to produce a morbid action of the membrane lining the teeth and sockets. It may be years before any serious injury is discovered, although pain may be frequently felt. As it is only periodical and of short duration, it passes unheeded by the individual, until the whole tooth becomes affected with

the same morbid symptoms ; it is then that a caries commences, and great and incessant pain is suffered.

When an individual, whose teeth are diseased from these causes, suffers from a cold, the nerves of the teeth are immediately affected ; they then betray their morbid sensibility, and become sympathetically attacked with inflammatory consequences—violent pain, and frequently acute sensations are felt with vividness to affect the eyes and the ears, until the individual seems doubtful where the seat of the disease really is situated. The greatest benefit is found by taking proper medicines, and using those means which the judicious surgeon has recourse to, to restore the general health ; sometimes local bleedings, with leeches or the lancet, and by washing the mouth with anodyne lotions.

Every thing taken into the mouth, at a temperature not exceeding 90° or 100° of Farenheit, would act as the best preventative against a decay from the causes we are describing: and in very cold weather it would be judicious to make use of tepid water to wash the mouth, when using the brush in the morning. But nature teaches us what is the most proper degree of heat or cold for all things used, either as food or drink ; for, whenever we take them at an improper temperature, a sensation is felt amounting to positive pain. (*d*)

INFLAMMATION THE CAUSE OF DECAY.

We have alluded to a tooth-ache from cold as resulting from general inflammatory affection of the system ; but then

we spoke of it rather as a symptom than a disease of a
 and recommended in such cases such means as would re
 the general health, which invariably removes the p
 sensation in the teeth. The latter, then, may be easil
 tinguished from a morbid affection of the vascular men
 that lines the teeth and the alveoli, and which see
 result from general debility ; for it mostly affects pers
 weak and delicate constitutions. In this disease, the
 almost agonizing, with very little intermission : the
 broken and the appetite becomes bad ; and these, as a
 quence, only tend to aggravate the sensation in the t
 further deranging the health of the individual. In t
 order, much benefit has been found by blisters be
 ears and on the back of the neck, with local bleedin
 use of spiritous tinctures. But much depends on the
 ence of the surgeon, for that which eases one patie
 only increase the painful sensations in another ; it
 fore, always better, to consult the medical attend
 family than venture to prescribe promiscuously, wi
 knowledge of the pathology of the mouth, or the t
 practice of physic.

During general or local inflammation, the saliva
 resembling the whites of eggs, with frequently an
 flavour. From these facts, we have been led to i
an acid peculiar to the saliva is secreted during fe
 that it very much affects the teeth ; it may, the
 referred as one of the many causes for their decay
 frequent opportunities, we have observed, that p
 feverish habits, or when affected with local inflammat
 their teeth of a very peculiar colour. (e)

THE EFFECT OF ACIDS ON THE TEETH.

Another cause, and a powerful one, for the decay of the teeth, is the removal of the calcareous earth by the action of acids upon them. When we reflect that every time we take these solvents into the mouth, a small portion of the lime is separated from the teeth, and carried away captive by the saliva, our surprise must cease that they soon become brittle and transparent. After using acids, a curious and disagreeable roughness is felt, which is an intimation that a removal of some of the earth from the teeth has taken place; and the oftener this occurs the sooner will their stamina be weakened, which makes them more susceptible to the influence of atmospheric changes, and consequently subjects them to undergo a caries; for, as the teeth become thinner, the membrane gets more exposed, the pain increases, and the decay proceeds with rapidity. When a stream of cold air finds access to the mouth, the pain is excruciating, and the sensation is felt all along the teeth. The use of anodyne washes in these cases, generally affords some relief.

Although we might dispense with the use of acids in our food, there are many cases of debility in which the physician recommends the mineral and vegetable acids, from their tonic and astringent qualities; and in many disorders of the stomach, great acidity is produced, which must all have the same bad effect on the teeth: the calcareous portions are removed, they then become black, and decay. To prevent such unpleasant consequences, particular attention ought to be observed when acids are used, either for food or medicinal purposes, to rinse the mouth after them with a small quantity

of carbonate of magnesia and water, or any other alkaline earth, as they will neutralise the corroding action of the acid. In some cases, we have been led, from experience, to infer, that an acid is secreted from the salivary glands, and in such cases the use of the *creta preparata*, as an alkaline earthy tooth powder, will be found quite sufficient to prevent them from being injured or discoloured. (*f*)

THE TEETH REMOVED BY FRICTION.

When the mouth is so formed that, during the process of mastication, the upper teeth come in contact with the lower, they are worn down by the continual friction of the parts rubbing together, and this renders them ultimately very painful. When they meet, however slight the percussion, they are so very sensitive, that an individual, to avoid the pain of eating, swallows the food before it has been properly reduced by the teeth; this deranges the stomach, and a reaction takes place, which accelerates their destruction.

The superior extremity of a tooth on being removed, leaves the membrane unprotected; and every thing then taken into the mouth—every change of temperature—causes much real misery and suffering. But very often in this disease, when nearly half of a tooth is worn down, there is an effort to arrest its progress; as if the beneficent Author of nature, to prevent the continual pain that follows from an exposure of the vascular membrane of the cavity, causes an osseous deposit, which fills up the cavity of the bone. The nervous sensibility is thus destroyed, and the teeth, although

they may have been deprived of much of their beauty, remain useful for many years. (*g*)

When the teeth are observed to be worn down from this peculiar form of the jaws, it would be judicious to avoid the use of acids or any thing that is likely to accelerate their decay ; and, therefore, the food ought to be of a kind that does not require much grinding, such as boiled meats, soups, &c.

Some individuals wear down the teeth by the pressure and friction required in mastication, even when the jaws are formed in the usual manner. Such persons are not affected with pain until the petuberations of the molares are entirely removed ; it is then they discover that the teeth are injured by the painful sensation produced when any thing is conveyed into the mouth. The same precautions as recommended in the last case, will be attended with the same probable benefit, as these smooth grinders may be still serviceable in preparing soft food for the stomach.

In some cases, the earthy particles of the enamel are gradually removed, and the teeth become very transparent ; and, as they have lost their hardening property, they are rendered very brittle. It is a curious fact, that, when this occurs, the individual may be otherwise in very good health ; nor can any solvent (excepting the saliva) be detected as the efficient cause. (*h*) Nosologists have considered transparent teeth symptomatic of pulmonary consumption ; but, as they may become so from the use of acids, and from this peculiar disease, it cannot be relied on as a constant diagnosis of this disorder. (*i*)

DECAY OF THE TEETH FROM ACCIDENTAL CAUSES.

The teeth, from their peculiar structure, are very liable to be damaged when biting hard substances, such as cracking hard nuts and fruit stones, drawing nails with them, &c. (j) They are also subjected to many kinds of accidents, such as being broken from a fall or a blow; in either cases, *caries* may be the result, attended with many other unpleasant consequences. If the membrane, lining the cavity of the tooth that is injured, becomes exposed, the individual suffers much excruciating pain; the gums are swollen, with much tension of the lip and the surrounding parts, and may probably extend to the sockets. Should no proper means be used to allay the symptoms, matter may form in the alveoli, and the seeds of decay imparted to many of the adjoining teeth.

In accidents of this kind, when much pain is felt, immediate recourse is had to have the tooth or teeth extracted, but which might in most instances be saved, and the individual receive comparative ease, if the nervous irritability was allayed with spirituous or opiate washes. And, if these applications failed in relieving the pain, the assistance of a surgeon dentist might be procured, who would destroy the nerve with the potential or actual cautery. The sensation of pain would be then removed; after which, if the broken tooth was situated in the front of the mouth, the injury could be effectually repaired, as the fractured part might be filed away, and a new crown engrafted to the sound fang that remained in the head, as we have had occasion to describe before.

Sometimes the corner of the *incisores* are broken of one or more of them by sudden percussion. These accidents are easily remedied with a file, with proper precautions to make them even again, so that there remains no unseemly defect. But it is very essential that this instrument should be used by operators, who are acquainted with the structure of the teeth, otherwise the person may suffer much pain, and then be obliged to have them extracted. (*h*)

The game of cricket is rather dangerous from the damage that may be done to the mouth when struck with a ball. If the teeth are knocked quite out, the coagulated blood must be carefully wiped out of the sockets; and, if they are returned again as soon as possible, the teeth become quite fast, particularly in young subjects. (*l*)

It must have occurred to all practitioners, when consulted in cases of fractured teeth, that, unless the enamel had vascularity, it is inexplicable that the edges of the broken tooth is so exquisitely painful; and that, at such a time, the enamel is so extremely sensitive, that it cannot bear the slightest touch. It is utterly impossible to explain the vividness of the pain, as resulting from the mechanical pressure of the tooth exerted against the vascular membrane lining the socket, when the affected tooth is slightly touched by the tongue. (*m*)

DISEASES PECULIAR TO THE FANGS OR ROOTS OF THE TEETH.

Pain of the teeth may proceed from the fangs, where frequently the disease commences, and which, if neglected, may produce much inconvenience and trouble.

In extracting some teeth, we find the extremity of the fang quite soft and of a horny appearance, which seems to have resulted from a removal of the earthy portion, whilst the investing membrane is left exposed and highly inflamed. If a diseased tooth of this kind is not extracted, excruciating pain is suffered until the inflammation, which extends to the membrane, undergoes a suppurative process, and then frequently ease is obtained. When a quantity of matter is formed in the socket, nature makes an effort to preserve the next teeth from being injured, as the matter, acting against the anterior side of the socket, *causes* an absorption of a portion of the bone, and thus makes an opening for itself into the mouth. This foetid matter is very offensive, and imparts a taint to the breath: it is essential then to wash the mouth with the tincture of bark, &c. If, however, the matter attacks the sides of the sockets next the other teeth, it very often so much affects them, that they become loosened and are obliged to be extracted.

There is another disease to which the fangs are liable, that is, an increase of the calcareous earth, which is deposited either at the extremity or at the sides of the roots of the affected teeth. These osseous tumours (called exostosis of the fangs) are at first unattended with very painful sensa-

tions ; but as they increase in size, of course, by making an unnatural pressure on the sides of the sockets and against its vascular membranous lining (which soon becomes inflamed), an uninterrupted acute pain follows until the tooth is removed.

Sometimes a deposition of new bone takes place between the sides of a tooth and the alveolar process, and they become firmly united by this osseous cement. This is untended with pain ; but when such a tooth is extracted, a portion of the socket must come away with it. The only safe mode of taking them out, is to use a strong pair of forceps, which removes the tooth with much ease, and brings but the smallest portion of the alveolar process with it. But if a key instrument is used, very often a large portion of the socket is removed, and one or two teeth with it,—invariably there is more unpleasant and unnecessary pain caused ; and if the operator even desists in time (from the great resistance and the tooth remaining immovable), still he is liable to break off the crown or a portion of it ; and generally the adjoining teeth are so weakened by the force used, that they become painful, and may be so injured that their decay is inevitable. (n)

GENERAL REMARKS ON THE TOOTH-ACHE.

It must already have appeared quite obvious, that persons not acquainted with the laws of the animal economy, and particularly of the structure of the jaws and teeth, are very likely to commit many errors ; sometimes by extracting the wrong teeth, and thus depriving an individual of an essential

instrument of mastication ; and who may thus, after a very limited cessation from pain, be doomed to suffer again the excruciating sensation, *for the disease may not have its seat in the mouth.* That these remarks may not be considered gratuitous, such occurrences are daily practised by persons called "Tooth drawers ;" and many lamentable consequences might be enumerated as resulting from the errors of such ignorant practitioners, who have no knowledge whatever of dental surgery, and consequently cannot have recourse to any other means of relieving tooth-ache *but by extraction.* When such persons are applied to, they make it a rule to fix an instrument on the tooth complained of, and immediately wrench it out, although it may be a sound one. But this operation does not give the wished for ease, *for very often the cause of the pain has not originated within the tooth, but it may have arisen from an inflammatory state of the body, indigestion, nervous excitement, and other sympathetic affections.*

Whether the pain of the teeth is occasioned from an original disease of them, from dyspepsia, or any other causes enumerated as producing decay, the painful sensations are periodical or constant ; and in both cases the acuteness may be influenced by many subordinate causes, such as atmospheric changes, great mental excitement and violent passions, which, by acting on the digestive and biliary organs, tend to increase the malady we are describing.

Pain of the teeth, when the result of sympathetic diseases of the nervous system, may sometimes only affect one, and at other times the whole of them. We have already recommended the most efficacious and judicious treatment when

the cause is sympathetic, *viz.* to consult the medical attendant of the family, as the only rational mode of cure is to attend to the alvine secretions. By the constant use of nostrums to the supposed affected part, the predisposition of the teeth to decay is increased, *and these specifics* may ultimately affect the vitality of the gums also. A kind of morbid action takes place in *caries*, when the membrane becomes affected, which is attended with painful sensations: it is then, that too often recourse is had to some empyrical remedy. At length nature, exhausted by these prejudicial and unsalutary means of attempting to remove "a local effect whilst the radical cause of the disease exists," abandons the sufferer to the unpleasant loss of the teeth, as a punishment for neglecting the proper means of cure.

These consequences would be often prevented if the individual consulted the professional dentist, or the surgeon who attended them in other diseases, it being admitted as an axiom "that a knowledge of the complaint is half the cure," *and this will be found practically illustrated in the pathology of the mouth.*

THE EFFECTS OF TARTAR, AS PRODUCING DISEASE IN THE TEETH AND GUMS.

The substance that deposits itself on the the teeth, of a yellowish, or blackish yellow colour, has been termed (although improperly so) *tartar*, it being simply a phosphate of lime and animal matter. (•)

The compound earthy substance is held in solution by the saliva, and when this fluid is evaporated during sleep, it is deposited on the anterior and posterior surfaces of the teeth; but there are many persons whose teeth are quite free from tartar, although they never make use of a brush; and very frequently those who may have been habituated to copious precipitations, when they have overcome some chronic affection, and an improvement has taken place in their health, cease to have any of this unpleasant *mucus* deposited; at least it is in such small quantities, that the teeth are not disfigured by it. From these facts the inference might be made, that large and habitual deposits of tartar are symptomatic of some disease of the system; and if practitioners would make observations on the different colours of this substance in various complaints, and also on its chemical differences, if any existed, the method of cure would be rendered much more simple and efficacious. Our own experience will enable us, without any premature decision (or anticipating the results to be derived from multiplied observations), to state that in scrofulous and syphilitic disorders, the tartar has uniformly a peculiarity of colour; and in febrile cases, or during any derangement of the digestive and biliary organs, there is invariably a greater flow of saliva, and always a greater deposit of a dark kind of tartar, in some persons appearing only as a superficial stain on the teeth.

In all local fevers, whether during the first or second dentition, there is a much greater quantity of saliva secreted than is required to keep the mouth properly moistened; or when we eat any thing very stimulating or acrid, a morbid action of the glands takes place, and until they recover their healthy state, cease to supply the quantity of saliva which is

essential, and a sensation of dryness of the mouth is felt, attended with much thirst.

We have observed that the tartar, whilst it is held in solution, seems to be intimately mixed, and in some instances quite saturated, with the saliva, which, undergoing decomposition, the evaporation of the fluid particles passing through the lips, prevents the aperture between them from closing (performing the same office as the tears do to the eye-lids). It is during this process that the tartar, from its own specific gravity, becomes deposited on the surfaces of the teeth. It insinuates itself on every part; and, although a portion of it is removed during the process of mastication, yet between the teeth and at the lower parts of the necks, where they join the gums, it remains and hardens, until the continual deposition of "stratum super-stratum" renders it visible to the eye of an observer. By its mechanical pressure on the gums, it forces them from the alveolar processes, which, on being exposed to the action of the atmospheric air, undergo a rapid decomposition; and the teeth, from thus losing their bony support (the sockets), become so weakly attached that they soon drop out;—the gums are very fetid and spongy, and so tender that they bleed on being touched. What must always be a subject of much regret to individuals who lose their teeth from a great accumulation of tartar is, *that no decay may have taken place in any of them.*

To obviate these unpleasant and injurious consequences, the greatest cleanliness should be observed. If a brush alone will not keep the teeth clean, testaceous powders, with any of the alkaline earths, will be of great assistance in removing the tartar without leaving any injurious effect, as

they only act mechanically; but in most advertised tooth powders there is an acid of some kind, which, although they give a transient beauty to the teeth, many bad effects are sure to follow the use of them. If there exist any predisposition to the disease called *caries*, the acidiferous powders are very likely to produce decay, as they remove portions of calcareous earth every time they are used.

But when all these precautions cannot prevent a disposition of the tartar, recourse ought to be had to a surgeon dentist to remove it whenever its accumulation renders it necessary. This operation, which is termed scaling the teeth, has been considered (but without the slightest foundation) to be injurious. It must be more so to have a hard extraneous body, which the tartar ultimately forms, remain undisturbed, and covering, with an unseemly yellow incrustation, a substance so very beautiful and ornamental as the enamel of the teeth. Those who suppose the hard deposited tartar to be harmless, might with as much reason contend *that dirt upon the face*, in alternate layers, would not be injurious. To our medical readers we need not give any illustration, but those who are unacquainted with the origin of many cutaneous diseases, and eruptions on the head, hands, face, &c. may be somewhat surprised when they are informed, that many of these diseases, peculiar to the lowest classes of society, arise generally from great uncleanness.

Experience, therefore, proves the operation of *scaling the teeth* to be essential for the health of the gums, and the preservation of them also; and it is never attended with unpleasant consequences if the dentist makes use of the proper instruments. But too often *muratic acid* has been

substituted by pretenders to dental surgery, either from an ignorance of its fatal consequences on the teeth, or for the ease with which it removes the tartar ; but the temporary whiteness is soon followed by a dark and unpleasant appearance of them—they are very tender and sensitive, and are rendered very liable to decay ; whilst the simple and useful process of scaling the teeth is to remove mechanically the adventitious covering from them, and no danger can possibly result from such a cleanly act. When, through great neglect, there may be a vast and solid encrustation to be removed, a small quantity ought to be taken away at different times ; for, after such a solid case of tartar (if too suddenly removed) is taken from the teeth, and the patient goes into the air, it is probable the cold may affect them ; but if the precaution was observed of washing the mouth with a little spirits, it would effectually prevent the cold air from producing any unpleasant effect.

Many writers on diseases of the teeth have recorded cases of such extraordinary deposits of tartarous mucus, that, although the persons have used the brush twice a day, at the end of six months they have been obliged to have recourse to a dentist. It is from having had many similar cases that we have ventured to remark, that this unnatural and unusual secretion may arise from some diseased action of the absorbents, or a morbid affection of the glands themselves, *for the saliva of such patients is capable of oxydizing metals very rapidly.*

The great accumulation of tartar during a mercurial course, it is unnecessary to describe, as it would only be a repetition without any further demonstration ; its effects on the gums we shall notice, when treating of the diseases peculiar to them.

DISEASES OF THE GUMS.

Whatever may be the causes for diseases of the gums, the consequences are always very unpleasant, and sometimes dangerous. The disorder to which they are most subject, is that which is called "scurvy of the gums," but which does not always appear as if resulting from a scrofulous habit; for the same disease may be owing to a derangement of the digestive and biliary organs; it may also result from great uncleanness, and through salivation from mercurial medicine. The gums, when affected with this disease from either of the causes enumerated, have symptoms in common; they have a soft and spongy feel, a dark red appearance, and sometimes a livid colour; they are very sore, bleed upon the slightest pressure, and invariably give a foetid taint to the mouth, which increases as the disorder proceeds. The treatment must, therefore, depend on the state of the health, *and the causes to which the complaint may be referred*. If really scrofulous, the gums are only affected sympathetically, and are, therefore, symptomatic of a constitutional disorder, which must be attended to before any local treatment can possibly effect a cure. If the diseased gums are the consequence of dyspepsia, restoring the organs of digestion and attending to the healthy state of the alvine secretions, which, by the cause being thus removed, renders it very easy to restore the gums to a good and healthy state.

When the disease of the gums is produced by the mechanical pressure of tartar, a cure is soon made after the teeth are scaled, as this hard extraneous coating on them first causes much irritation, and which is followed by an inflam-

mation of the gums and the morbid affections which follow. When mercurial medicine affects the gums, the same observations will apply as in the last case. Abstain from the irritating effect of the medicine, and the mouth may be easily cured ; but if this disorder of the gums is suffered uninterruptedly to proceed in its baneful course, the gums recede, the alveolar processes are exposed, which soon become absorbed, and the teeth drop out quite sound. Very often large fungous excrescences are formed on the sides or edges of such diseased gums, which may obstruct the tongue in speaking ; and whenever they are touched, the mouth is filled with a very disagreeable and highly offensive fluid, smelling like blood, and no cure can possibly be made of them, unless removed with the knife or by a ligature passed through the pedicle that they are attached by (the latter mode was strongly recommended by Mr. Fox in preference to the former), and the edges of the wound treated with the actual or potential cauter. To this peculiar morbid state of the gums, may be attributed their wasting away, even when strong stimulants are used, and their vessel scarified ; and also when the arched part, that rises up between the teeth, grows with such rapidity, that they cover the gums. “This preternatural growth” must be treated in a similar manner as the fungus-like excrescences, which they may ultimately form, unless properly attended to. (*p*).

When parts of carious teeth are left in the sockets, they may be the cause of much pain and unpleasant consequences. To diseased stumps may be attributed the small ulcers that form in the mouth, also gum-boils, and very often troublesome and painful abscesses. These things might be prevented, and much suffering spared, if, on the first intimation of pain

from such diseased fangs, the individual had them extracted. The instrument now used for this purpose, raises them out of the socket instantaneously, with very little trouble, and scarcely any pain. When an abscess commences, it appears sometimes like a hard indolent tumour; afterwards it becomes red and inflamed, and as the suppurative process proceeds, a violent throbbing is felt, the sleep is disturbed, which affects very materially the health. In cases of this kind, a dentist or the medical attendant ought to be consulted, for when *matter* has already formed, care would be taken to give it a passage within the mouth, for, if it is left to nature, an opening is made on the outside of the face (the ulceration proceeds so rapidly), "leaving an unseemly scar, which may be confounded for a scrofulous wound." (q)

TIC DOLOUREUX.

That very distressing disorder called *tic dolooureux*, has been attributed to carious fangs, for it is supposed that, when diseased stumps have destroyed the healthy state of the surrounding parts, a morbid action takes place in the nerves by which they are attached, and that such a diseased nerve imparts its morbid sensibility to the seat of those nerves from which it originated. It is the influence of this morbid consequence that produces the agonizing disorder of *tic dolooureux*. "Although all the nerves of the face may be affected in this disease, its seat is generally referred by patients to that branch of the fifth pair which comes out of the infra-orbitary foramen."

The late Dr. William Fothergill published an interesting pamphlet on this disease, wherein he gave its history and treatment. From this author we learn, that it has frequently been confounded with rheumatism and hemi-crania, as it has many symptoms in common with these two disorders. The tic douloureux is extremely rare; "it very frequently commences in the upper lip, but its immediate seat is in the nerves of the face. It may be traced shifting its agonizing attacks along the whole course of the nerve affected," sometimes darting with excruciating pain to the eye and the ear, and seems to affect the whole side of the face, and thus is likely to be confounded with hemi-crania. Sometimes the convulsive sensations are so great, and the pain so exquisitely vivid on any ordinary movement of the body, that the individual, in order to avoid such discordant vibrations, feels alarmed even to use the jaws for the purposes of mastication.

A French physiologist and dentist, of the name of Gerraux, after enumerating the many causes to which tic douloureux has been ascribed, considers that persons of weak digestive organs and irritable habit are most liable to be affected. The humidity of the air and atmospheric changes, may be referred to as the exciting causes of this disorder.

We forbear offering any further remarks on this disease of the nerves, as it belongs more to the practice of the physician than the surgeon dentist, although in most works on the pathology of the teeth it has been described; for very frequently persons labouring under this malady have applied to have many teeth extracted, supposing the pain they suffered to have been in them. In Mr. Fox's valuable lectures there are two or three cases of tic douloureux given,

with the curative plan adopted by that eminent surgeon, Sir Astley Cooper. (r)

DISEASES OF THE PALATE.

The roof or arch of the mouth, so essential for a clear accentuation, is sometimes diseased from birth or from syphilitic and scrofulous affections.

When there is a cavity between the bones of the hard palate from a congenital malformation, nature very frequently, if the fissure is narrow, effects an union between them by a fresh deposition of bone, which thus unites them without the assistance of art ; but sometimes the fissure extends quite through the soft palate and uvula ; then it is impossible that nature can effect a cure, for, as the person grows, the parts become more extended, until it becomes a permanent deformity and inconvenience ; and the same consequence results as when the bones are removed by absorption from the before mentioned causes, which sometimes are truly distressing.—The speech, instead of being clear and harmonious, is rendered confused and unpleasant ; the words being pronounced so very indistinctly, are in many instances quite unintelligible. The food is carried during deglutition up into the nose, and mixes with the mucus, a portion of which returns with it into the mouth, rendering it very disagreeable, and a constant source of anxiety to the individual.

As this branch of mechanical surgery is much improved of late years, persons suffering from defective palates may

have them, in most cases, remedied by a most ingenious and admirable contrivance. And it is principally to the French dentists that the scientific improvement of them may be attributed; they have given to them the name of *obturateurs* (from the latin, *obturo*, to stop up) and as mechanical contrivances of this kind are varied according to the peculiar case, it would be answering very little purpose to attempt describing them; but to those who may wish for a general knowledge of the history of the various modes that have been tried at different periods, and with various success, we refer them to a very interesting work published by Mr. Snell, surgeon dentist, of London, on the different modes of fixing obturateurs. To those who may wish for some case to be described of diseased palates in this work, we refer them to the note at the end for an account of one that is truly lamentable to contemplate. (s)

DISEASES OF THE ANTRUM.

The *antrum* is a bony cavity, situated in the upper maxillary, extending from the side of the nose to the second molaris. It is furnished with a foramen (or passage into the nose), and is lined with a pituitary membrane, which is subjected to similar diseases as the membranous linings of other cavities, such as inflammation and suppuration; which latter consequence may superinduce a caries in the surrounding bone, unless a passage is formed for the matter to escape. The causes of inflammation of the antrum may be various; the general effect which results from the same is, that the foramen connecting this *sinus* with the nose becomes

stopped up; and an intimation is given that the antrum is diseased by a throbbing pain at the side of the nose, and a redness and tension at the affected side of the face—the pain sometimes darting towards the temples. The mode of cure generally adopted, is to extract the first or second molaris. If the latter is decayed, that ought to be removed in preference to the former, *being situated nearest the extremity of the antrum*. The fangs of these teeth sometimes make a cavity into it, as the bony partition is so thin; but, when that is not the case, a perforation ought to be made with an instrument, and the matter formed during the suppurative process has then an artificial passage into the mouth. To keep this open, Mr. Fox recommended a piece of elastic bougie (made of prepared Indian rubber) to be placed through the socket, and into the opening made in the antrum. Thus a canal is formed for the egress of the matter, and this can remain, without any inconvenience to the patient, until a cure is made; to accelerate which, the antrum may be injected with tincture of myrrh and water, or weak solutions of nitrate of silver, &c. &c.

There is another disease to which this *sinus* is liable. Sometimes fungus excrescences are formed in it, attended with much pain and suffering; but this disorder is very rare. Whenever it exists, the tooth or teeth before mentioned must be removed, and as large a cavity formed as will enable the surgeon either to cut it out, or destroy it by the actual cautery. And, even if the first mode can be effectually performed, to prevent it from growing again the latter operation will be found the best and most certain cure, as the actual cautery, when applied, destroys the vitality of the pedicle of the *fungus* removed.

Many writers, when treating of the pathology of the antrum, have described a few cases (but on doubtful authority) where insects have been found in it, supposed to be generated by some peculiar disease. It is most probable, whenever any such insects have been found in it, that they have been accidentally introduced from the nose through the foramen which connects the antrum with it.

ARTIFICIAL TEETH.

As every case of loss of teeth may be different, it would answer very little purpose to describe the manner by which they are again supplied. We can only state, that the mechanical contrivances for fixing one or more teeth have been rendered so perfect, that individuals may be assured of deriving much real comfort from the assistance of artificial teeth; for the speech is rendered clear and intelligible, the great deformity the loss occasions is remedied, and the food may be reduced as well as if the natural teeth remained.— But this depends much on the nicety with which they are fitted, and the mode by which they are attached. We may, therefore, briefly state, that ligatures or wires of gold, or any other metal, ought to be avoided, and only flat elastic gold springs used; and if the teeth previously fit well, *these* will be quite sufficient to keep them firm in their places, without any unnatural pressure on the neighbouring teeth. These observations apply to those artificial ones formed from the teeth of the hippopotamus; but there is another and a much more elegant mode now generally adopted, particularly for the loss of the front teeth. This mode consists in

fixing natural crowns of teeth (corresponding with those that are removed), on a plate of gold or platina, fitted accurately over the gums, and attached by small gold elastic flat springs soldered to the plate, and which fasten round the teeth on each side. This plan so effectually prevents the individual wearing them from being supposed to do so, that we have patients at this time who have had teeth supplied in this manner for years, and their own families have not yet discovered it.

NOTES.

(a) The formation of the teeth and enamel is certainly one of the most curious processes of nature. As I have before observed, during their first state they consist of a pulpy substance invested in a membrane; and when the bone is advanced in its formation, and the pulp elongates to form the fang or fangs, the *enamel* begins to be secreted and mixes with a fluid exuded from the investing capsule. What must excite our admiration and wonder is, that a substance of its hardness (for it will give sparks when struck with steel) should result from a combination of the same earths as other bones are composed of, *viz.* phosphate, carbonate, and fluuate of lime mixed with gelatine (or animal glue). This hardness of the enamel has been referred by some physiologists to be principally owing to the fluid mixing with it, for when concreted it has been found to be composed of similar chemical properties as muscular fibre, which has been named *fibrina*. There are many other theories by no means conclusive, but Mr. Hatchett's experiments enabled him to offer clear and satisfactory phenomena to account for the difference in the hardness of bones, shells, and zoophytes, and which may be comprehended in the expressive word *structure*. The arrangement of the particles, and their degree of mechanical adhesion, explains the phenomena of the substance in the gradations from moderately hard to very hard. The enamel is formed in radii, proceeding from a common centre; this gives it peculiar strength, rendering it not liable to be broken during percussion, as would have been the case, if, instead of its present crystalline arrangement, it had had a longitudinal structure.

(b) The artist and the rational philosopher (although unconnected with the medical profession) would derive an endless train of intellectual cogitation and mental pleasure by a knowledge of the anatomy and physiology of our truly wonderful mechanism. It is with much real pleasure, I here can refer to a very interesting work published on these subjects, in a very popular form, by my respected friend, Mr.

Thomas Sandwith, surgeon. &c. Beverley, in which, although written in an easy and comprehensive style, the Author has given graphic illustrations of the bones, muscles, arteries, &c. by different views of the human skeleton, rendering this little volume very complete and instructive.

(c) I am infinitely obliged to my esteemed friend, Mr. R. Casson, surgeon, of Hull, for the following fact, which proves the necessity of the chemical action of the saliva:—"In many dyspeptic patients, when the "glands cease to secrete a sufficient quantity of saliva, the stomach rejects the food; and when such persons eat soup that does not stimulate the "glands, and consequently very little of this fluid mixes with the soup, "the stomach either rejects it, or is subjected to many unpleasant "sensations, not having been chemically prepared by the saliva." This proves the great and beneficial use of the latter in the animal economy, and teaches us the necessity of exciting the action of the glands whilst eating, by moving the jaws as much as possible.

(d) Mr. Joseph Fox accounted for northern nations generally having very bad teeth, from their taking food, &c. at very extreme temperatures, and from using stimulating liquors; whilst the inhabitants of warm and tropical countries make use of their aliment at a moderate degree of heat, and their drink, says this author, "is only to allay "thirst, and not to stimulate."

(e) "The saliva has a great affinity for oxygen, so much so, that "thin leaves of gold or platina, when triturated with this fluid, become "rapidly oxydized." It may probably be inferred, that it is from the temperature of this fluid being raised in all febrile cases, that it is enabled to exert a greater affinity for the acidifying principle; and therefore, my former suggestion, as to a peculiar acid being secreted in inflammatory cases, may be unfounded.

(f) The teeth are composed of a phosphate and carbonate of lime, with membranous and animal glue. The great affinity that lime has for all the acids, is well known, but that it exercises the greatest for the sulphuric and muriatic acids; and as these are mostly used medicinally, the precautions given before will prevent their removing much of the earthy portions of the teeth. I need not point out to my medical readers the injurious effects invariably produced by these acids, when given by empirical dentists as washes for the mouth, or when used to facilitate the removal of the tartar.

(g) I have molares by me which beautifully illustrate the fact of teeth being filled up; and what renders the circumstance peculiarly interesting, is, that the new osseous substance approaches to the hardness of the enamel, being very compact, and of a dark vitreous appearance.

(h) This diseased state of the enamel has been very often noticed by many physiologists, and Mr. Fox has related instances where the lime of the enamel has been removed on each of its sides, whilst the centre of the tooth, anteriorly and posteriorly, has remained, having the appearance of a mound; as if nature had endowed it with an intelligence, by its thus making an effort to protect the part where the nervous membrane is situated.

(i) In a treatise on the teeth, published by Thomas Berdmore, Esq. he mentions having tried experiments with the advertised tooth-powders, with a view of proving the injurious action on that very beautiful substance the enamel. As they most of them contained an acid in some form, he was enabled to remove the enamel of a tooth with a brush, and also with a piece of linen rag dipped into the powders, in two hours. *Even some of the most harmless* removed sufficient of the earthy moleculæ, to render the teeth transparent and liable to break. Some of the powders contained the pumice stone. It is sufficient to mention this fact; its grinding effects I need not point out. The use, then, of powders or acids, in such diseases of the enamel, must facilitate their destruction.

(j) When two substances of a vitreous nature, and equally hard, are struck together, they invariably break, as is the case with stones, and also the teeth are liable to such accidents; but, in order to preserve them from damage by percussion, the jaws are so constructed that the upper teeth overlap the lower.

(k) The operation of filing the teeth is attended, in many instances, with much benefit in other cases than those resulting from accident; for, when teeth press together very much, a caries may follow, particularly when a predisposition to decay exists. If a thin file is passed between the teeth, they are rendered more likely to resist disease; besides which, when they are separated, they are more beautiful, by slight contrasted shadows relieving the otherwise too great uniformity. The North American Indians, either from traditional superstition, or some peculiar association of beauty, file their teeth into sharp angles.—Mr. Joseph Fox relates this fact in his valuable lectures, to prove the safety of this instrument when used by scientific operators. Mr. Cline had a head of one of these Indians with the teeth filed in the manner before mentioned. It may be proper further to observe, that as the sides of the superior portion of each tooth near the extremity were only filed away, the membranous lining was not in any manner exposed, and hence no pain attended this superstitious operation, nor did the teeth decay.

(l) A case of a very interesting kind lately came under my professional treatment, and which I am induced to describe, with the hope that, if the practice is new, its utility may induce others to adopt it.—A highly respectable and intelligent gentleman applied to me to fasten his teeth, that had become loosened through a disease of the gums and a partial absorption of the alveolar processes; and one of the central incisors dropped quite out, and which, of course, the gentleman was anxious to have fastened again. I, therefore, wiped out the socket quite clean, and removed all the indurated tartar from the neck of the tooth and the fang; but, before inserting it into the socket, I dipped a piece of lint into a solution of the nitrate of silver, with which I further cleansed the alveolar and stimulated the vascular lining of it; the tooth was then placed quite up into the socket and tied with a ligature, and little doubt remains but the tooth will be serviceable and ornamental for years, as an attachment has taken place. The gentleman, with much urbanity and philanthropic feeling, kindly called to inform me, that the tooth has recovered its sensibility, and that, when it is struck or used in mastication, a similar sensation is experienced as in the other teeth, and suggested to me that I might publish the case.

(m) From numerous experiments it has been found, that the teeth as well as the bones of animals become stained when fed upon madder, with its colouring matter; but that when this substance has been withheld for some time, *the enamel retains the dye*, whilst the other bones gradually acquire their natural colour. From these facts, and from the circumstance, that the enamel could not be injected, induced the late Mr. John Hunter to conclude that the enamel was not vascular; but Mr. Joseph Fox and other physiologists, however, supposed that it was, from its being so extremely sensitive when injured by a blow, or diseased. A knowledge of Mr. Hatchett's valuable experiments on bones, &c. with the view of ascertaining their constituents, led me to hope that some facts might be elicited, if the calcareous earth of the enamel was gradually separated. For this purpose, I suspended teeth of different ages (both of the temporary and permanent set) to the slow action of water just acidulated with muriatic acid, and although I cannot, from my present results, prove that the enamel is supplied with blood vessels, &c., yet the reticulated appearance of some of them, makes me sanguine that, if these experiments are continued, it is more than probable its vascularity will be demonstrated. Some of the adult teeth presented to the eye numerous globules of air; these, of course, must have been placed in receptacles, but whether they have been the result of the menstruum acting only partially on the surface of the enamel, or whether the small vessels, after having their earthy contents cleared from them, become cells for the innumerable globules observed, must

be decided by more practised and scientific physiologists. My very ingenious friend, Mr. R. Casson, suggested, on seeing the experiments, "that the globules might be the carbonic acid (of the carbonate of lime) not disengaged." As truth and love for my profession is my sole object, I may be excused for thus offering hypotheses, whether of my own or those of my scientific friends.

(n) "The bony cement which joins the tooth to the socket is often formed without pain, or any perception of diseased action going on; yet it may be the consequence of torpor of the absorbents, or excessive action of the secreting arteries." When a tooth is undergoing the carious or ulcerative process, we may infer the before mentioned causes reversed, *viz.* the absorbents taking the calcareous portions of the diseased tooth, and the secreting vessels being in a torpid state, not supplying the fresh bony matter, will sufficiently account for the disease of *caries*. What renders this suggestion most probable is, that the osseous union is in most cases on the side at which the *caries* is situated.

(o) The tartar, besides being composed of phosphate of lime and gelatinous substance, contains carbonate of magnesia, soda, potash, &c. &c. and other neutral salts, varying in different coloured tartars, and probably in different diseases.

(p) To persons troubled with spongy gums, I particularly recommend the use of a tooth-pick made of soft wood (the willow for example), as it will prevent portions of food from remaining between the teeth, which, from its putrefactive process, increases the disease and the unpleasant factor of the breath.


(q) When carious fangs produce gum-boils or abscesses, they ought to be removed, for they may so disease the surrounding bone, that portions sometimes mortify, and come away by the process called *exfoliation*.

(r) From the present rapid strides that have been made in the practice of physic, we may hope that the excruciating disorder of the nerves, called *tic douloureux*, will still receive the attention of scientific men, and that its agonizing consequences will be equally under the control of the physician's skill as most other diseases to which we are subject.—The separating of the nerve is now nearly abandoned in this disorder, as a union might take place again, and consequently the cure is not always certain; but, as it is now treated as a sympathetic consequence, the most interesting cures of it I have had an opportunity (from my extensive medical acquaintance) of witnessing, which obliges me to offer my

humble meed of praise to those highly gifted and talented practitioners whose object is to render perfect the greatest of all sciences—the practice of medicine.

(9) To my medical readers, I offer no apology for submitting to their particular notice the following truly distressing case, where the destructive ravages of disease have removed many of the bones of the nose and mouth:—The individual has lost the *ossa nasi*, and the spongy bones on one side of the nose, through which the antrum on that side is exposed, and may be examined to the farthest extremity of it.—A frightful cavity is also formed in the *os palati*, nearly an inch and an half square, besides a portion (in the anterior part of the mouth) of the maxillary bone, *and the whole of the alveolar processes and the teeth*, with a part of the *vomer* and *uvula*. It would require a more powerful pen than mine to describe the sensations of the person, *and, although unknown, the case will excite general sympathy*. I may add, that I have still some hopes that much comfort may be afforded by mechanical contrivances.

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